

Claims 1-101 cancelled

102. A method of forming the novel compounds of claim 1 comprising the steps of:

providing a gaseous catalyst comprising at least one selected from the group consisting of atoms of Li, Be, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Kr, Rb, Sr, Nb, Mo, Pd, Sn, Te, Cs, Ce, Pr, Sm, Gd, Dy, Pb, and Pt;

providing gaseous hydrogen atoms;

reacting said gaseous catalyst with said gaseous hydrogen atoms, thereby forming hydrino from said gaseous hydrogen atoms;

reacting said hydrino with at least one selected from the group of a source of electrons, H^+ , increased binding energy hydrogen species, and other element to form said novel compounds.

103. A method of claim 102 of forming novel compounds wherein a gaseous catalysts comprises at least one selected from the group consisting of a source of K^+ , a source of Rb^+ , and a source of He^+ .

104. A method of claim 103 of forming novel compounds wherein the source of K^+ is potassium metal.

105. A method of claim 103 of forming novel compounds wherein the source of Rb^+ is rubidium metal.

106. A method of claim 102 of forming novel compounds further comprising the step of applying an adjustable electric or magnetic field to control the rate of formation of hydrino.

107. A method for extracting energy from hydrogen atoms comprising the steps of:

providing a gaseous catalyst comprising at least one selected from the group consisting of atoms of Li, Be, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Kr, Rb, Sr, Nb, Mo, Pd, Sn, Te, Cs, Ce, Pr, Sm, Gd, Dy, Pb, and Pt;

providing gaseous hydrogen atoms; and

reacting said gaseous catalyst with said gaseous hydrogen atoms, thereby releasing energy from said gaseous hydrogen atoms.

5 108. A method of claim 107 for extracting energy from hydrogen atoms wherein a gaseous catalysts comprises at least one selected from the group consisting of a source of K^+ , a source of Rb^+ , and a source of He^+ .

10 109. A method of claim 108 for extracting energy from hydrogen atoms wherein the source of K^+ is potassium metal.

110. A method of claim 108 for extracting energy from hydrogen atoms wherein the source of Rb^+ is rubidium metal.

15 111. A method of claim 107 for extracting energy from hydrogen atoms further comprising the step of applying an adjustable electric or magnetic field to control the rate of energy release.

20 112. A cell for extracting energy from hydrogen atoms comprising:
a reaction vessel;
a source of gaseous hydrogen atoms; and
a source of a gaseous catalyst comprising at least one
selected from the group consisting of atoms of Li, Be, K, Ca, Ti,
25 V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Kr, Rb, Sr, Nb, Mo, Pd, Sn, Te, Cs, Ce, Pr, Sm, Gd, Dy, Pb, and Pt.

30 113. A cell of claim 112 for extracting energy from hydrogen atoms wherein a gaseous catalysts comprises at least one selected from the group consisting of a source of K^+ , a source of Rb^+ , and a source of He^+ .

35 114. A cell of claim 113 for extracting energy from hydrogen atoms wherein the source of K^+ is potassium metal.

115. A cell of claim 113 for extracting energy from hydrogen atoms wherein the source of Rb^+ is rubidium metal.

5 116. A cell of claim 112 for extracting energy from hydrogen atoms further comprising an adjustable electric or magnetic field source.

117. A cell for extracting energy from hydrogen atoms comprising:
a reaction vessel;

10 a chamber communicating with said vessel, said chamber containing gaseous hydrogen atoms or a source of said hydrogen atoms; and

15 a catalyst reservoir communicating with said reaction vessel or a boat contained in said reaction vessel, said catalyst reservoir or boat containing a gaseous catalyst comprising at least one selected from the group consisting of atoms of Li, Be, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Kr, Rb, Sr, Nb, Mo, Pd, Sn, Te, Cs, Ce, Pr, Sm, Gd, Dy, Pb, and Pt.

20 118. A cell of claim 117 for extracting energy from hydrogen atoms wherein a gaseous catalysts comprises at least one selected from the group consisting of a source of K^+ , a source of Rb^+ , and a source of He^+ .

25 119. A cell of claim 118 for extracting energy from hydrogen atoms wherein the source of K^+ is potassium metal.

120. A cell of claim 118 for extracting energy from hydrogen atoms wherein the source of Rb^+ is rubidium metal.

30 121. A cell of claim 117 for extracting energy from hydrogen atoms further comprising an adjustable electric or magnetic field source.

122. A method of claim 121, wherein the increased binding energy hydrogen species is selected from the group consisting of H_n , H_n^- , and H_n^+ where n is a positive integer, with the proviso that n is greater than 1 when H has a positive charge.

123. A method of claim 121, wherein the increased binding energy hydrogen species is selected from the group consisting of (a) hydride ion having a binding energy that is greater than the binding of ordinary hydride ion (about 0.8 eV) for $p = 2$ up to 23 in which the binding energy is represented by

$$\text{Binding Energy} = \frac{\hbar^2 \sqrt{s(s+1)}}{8\mu_e a_0^2 \left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^2} - \frac{\pi\mu_0 e^2 \hbar^2}{m_e^2 a_0^3} \left(1 + \frac{2^2}{\left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^3} \right)$$

where p is an integer greater than one, $s = 1/2$, π is pi, \hbar is Planck's constant bar, μ_0 is the permeability of vacuum, m_e is the mass of the electron, μ_e is the reduced electron mass, a_0 is the Bohr radius, and e is the elementary charge; (b) hydrogen atom having a binding energy greater than about 13.6 eV; (c) hydrogen molecule having a first binding energy greater than about 15.5 eV; and (d) molecular hydrogen ion having a binding energy greater than about 16.4 eV.

124. A method of claim 123, wherein the increased binding energy hydrogen species is a hydride ion having a binding energy of about 3.0, 6.6, 11.2, 16.7, 22.8, 29.3, 36.1, 42.8, 49.4, 55.5, 61.0, 65.6, 69.2, 71.5, 72.4, 71.5, 68.8, 64.0, 56.8, 47.1, 34.6, 19.2, or 0.65 eV.

125. A method of claim 124, wherein the increased binding energy hydrogen species is a hydride ion having the binding energy:

$$\text{Binding Energy} = \frac{\hbar^2 \sqrt{s(s+1)}}{8\mu_e a_0^2 \left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^2} - \frac{\pi \mu_0 e^2 \hbar^2}{m_e^2 a_0^3} \left(1 + \frac{2^2}{\left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^3} \right)$$

where p is an integer greater than one, $s = 1/2$, π is pi, \hbar is Planck's constant bar, μ_0 is the permeability of vacuum, m_e is the mass of the electron, μ_e is the reduced electron mass, a_0 is the Bohr radius, and e is the elementary charge.

126. A method of claim 121, wherein the increased binding energy hydrogen species is selected from the group consisting of

- a. a hydrogen atom having a binding energy of about $\frac{13.6 \text{ eV}}{\left(\frac{1}{p}\right)^2}$ where p is an

integer,

- b. an increased binding energy hydride ion (H^-) having a binding energy of

$$\text{about } \frac{\hbar^2 \sqrt{s(s+1)}}{8\mu_e a_0^2 \left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^2} - \frac{\pi \mu_0 e^2 \hbar^2}{m_e^2 a_0^3} \left(1 + \frac{2^2}{\left[\frac{1 + \sqrt{s(s+1)}}{p} \right]^3} \right) \text{ where}$$

$s = 1/2$, π is pi, \hbar is Planck's constant bar, μ_0 is the permeability of vacuum, m_e is the mass of the electron, μ_e is the reduced electron mass, a_0 is the Bohr radius, and e is the elementary charge;

- c. an increased binding energy hydrogen species $H_4^+(1/p)$;
d. an increased binding energy hydrogen species trihydrino molecular ion, $H_3^+(1/p)$, having a binding energy of about $\frac{22.6}{\left(\frac{1}{p}\right)^2} eV$ where p is an integer,

- e. an increased binding energy hydrogen molecule having a binding energy of about $\frac{15.5}{\left(\frac{1}{p}\right)^2} eV$; and

- f. an increased binding energy hydrogen molecular ion with a binding energy of about $\frac{16.4}{\left(\frac{1}{p}\right)^2} eV$.

127. A method of claim 126, wherein p is from 2 to 200.
128. A method of claim 121, which is greater than 50 atomic percent pure.
129. A method of claim 128, which is greater than 90 atomic percent pure.
130. A method of claim 129, which is greater than 98 atomic percent pure.

131. A method of claim 121, wherein said increased binding energy hydrogen species is negative.

132. A method of claim 131, comprising at least one cation.

133. A method of claim 132, wherein the cation is a proton, H_2^+ , H_3^+ ,

$$H_2^+ \left[2c' = \frac{2a_o}{p} \right]^+, H_3^+(1/p), \text{ or } H_4^+(1/p).$$

134. A method of claim 121, wherein the other element is an ordinary hydrogen atom or an ordinary hydrogen molecule.

135. A method of claim 121, having a formula $[KH_mKCO_3]_n$ wherein m and n are each an integer, the compound contains at least one H, and the hydrogen content H_m of the compound comprises at least one said increased binding energy hydrogen species.

136. A method of claim 121, having a formula $[KH_mKNO_3]_n^{m'+} n' X^-$ wherein m, m', n and n' are each an integer, X is a singly negative charged anion, the compound contains at least one H, and the hydrogen content H_m of the compound comprises at least one said increased binding energy hydrogen species.

137. A method of claim 121, having a formula $[KHKNO_3]_n$ wherein n is an integer, and the hydrogen content H of the compound comprises at least one said increased binding energy hydrogen species.

138. A method of claim 121, having a formula $[KHKOH]_n$ wherein n is an integer and the hydrogen content H of the compound comprises at least one said increased binding energy hydrogen species.

139. A method of claim 121, having a formula $[MH_mM'X]_n$ wherein m and n are each an integer, M and M' are each an alkali or alkaline earth cation, X is a singly or

doubly negative charged anion, the compound contains at least one H , and the hydrogen content H_m of the compound comprises at least one said increased binding energy hydrogen species.

140. A method of claim 121, having a formula $[MH_m M' X']_n^{m'+} n' X^-$ wherein m , m' , n , and n' are each an integer, M and M' are each an alkali or alkaline earth cation, X and X' are a singly or doubly negative charged anion, the compound contains at least one H , and the hydrogen content H_m of the compound comprises at least one said increased binding energy hydrogen species.

141. A method of claim 121, having a formula $[MH_m M' X']_n^{m'-} n' M''^{++}$ wherein m , m' , n , and n' are each an integer, M , M' , and M'' are each an alkali or alkaline earth cation, X and X' are each a singly negative charged anion, the compound contains at least one H , and the hydrogen content H_m of the compound comprises at least one increased binding energy hydrogen species.

142. A method of claim 121, having a formula $[MH_m]_n^{m'+} n' X^-$ wherein m , m' , n , and n' are each an integer, M is alkali or alkaline earth, organic, organometallic, inorganic, or ammonium cation, X is a singly or doubly negative charged anion, the compound contains at least one H , and the hydrogen content H_m of the compound comprises at least one increased binding energy hydrogen species.

143. A method of claim 121, having a formula $[MH_m]_n^{m'-} n' M''^{++}$ wherein m , m' , n , and n' are each an integer, M and M' are an alkali or alkaline earth, organic, organometallic, inorganic, or ammonium cation, the compound contains at least one H , and the hydrogen content H_m of the compound comprises at least one increased binding energy hydrogen species.

144. A method of claim 121, having a formula $M(H_{10})_n$ wherein n is an integer, M is other element such as any atom, molecule, or compound, and the hydrogen content

$(H_{16})_n$ of the compound comprises at least one increased binding energy hydrogen species.

145. A method of claim 121, having a formula $M(H_{10})_n$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{16})_n$ of the compound comprises at least one increased binding energy hydrogen species.

146. A method of claim 121, having a formula $M^+(H_{16})_n^-$ wherein n is an integer, M is other element such as an alkali, organic, organometalic, inorganic, or ammonium cation, and the hydrogen content $(H_{16})_n^-$ of the compound comprises at least one increased binding energy hydrogen species.

147. A method of claim 121, having a formula $M^+(H_{16})_n^-$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{16})_n^-$ of the compound comprises at least one increased binding energy hydrogen species.

148. A method of claim 121, having a formula $M(H_{16})_n$ wherein n is an integer, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_{16})_n$ of the compound comprises at least one increased binding energy hydrogen species.

149. A method of claim 121, having a formula $M(H_{16})_n$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{16})_n$ of the compound comprises at least one increased binding energy hydrogen species.

150. A method of claim 121, having a formula $M(H_{24})_n$ wherein n is an integer, M is other element such as any atom, molecule, or compound, and the hydrogen content

$(H_{24})_n$ of the compound comprises at least one increased binding energy hydrogen species.

151. A method of claim 121, having a formula $M(H_{24})_n$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{24})_n$ of the compound comprises at least one increased binding energy hydrogen species.

152. A method of claim 121, having a formula $M(H_{60})_n$ wherein n is an integer, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_{60})_n$ of the compound comprises at least one increased binding energy hydrogen species.

153. A method of claim 121, having a formula $M(H_{60})_n$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{60})_n$ of the compound comprises at least one increased binding energy hydrogen species.

154. A method of claim 121, having a formula $M(H_{70})_n$ wherein n is an integer, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_{70})_n$ of the compound comprises at least one increased binding energy hydrogen species.

155. A method of claim 121, having a formula $M(H_{70})_n$ wherein n is an integer, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{70})_n$ of the compound comprises at least one increased binding energy hydrogen species.

156. A method of claim 121, having a formula $M(H_{10})_q(H_{16})_r(H_{24})_s(H_{60})_t(H_{70})_u$ wherein q, r, s, t, and u are each an integer including zero but not all zero, M is other element such as any atom, molecule, or

compound, and the hydrogen content $(H_{10})_q(H_{16})_r(H_{24})_s(H_{60})_t(H_{70})_u$ of the compound comprises at least one increased binding energy hydrogen species.

157. A method of claim 121, having a formula

$M(H_{10})_q(H_{16})_r(H_{24})_s(H_{60})_t(H_{70})_u$ wherein q, r, s, and t are each an integer

including zero but not all zero, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_{10})_q(H_{16})_r(H_{24})_s(H_{60})_t(H_{70})_u$ of the compound

comprises at least one increased binding energy hydrogen species.

158. A method of claim 121, having a formula MX wherein M is positive, neutral, or

negative and is selected from the list of H_{16} , $H_{16}H$, $H_{16}H_2$, $H_{24}H_{23}$, OH_{22} , OH_{23} , OH_{24} , MgH_2H_{16} , NaH_3H_{16} , $H_{24}H_2O$, CNH_{16} , CH_{30} , SiH_4H_{16} , $(H_{16})_3H_{15}$, $SiH_4(H_{16})_2$, $(H_{16})_4$, H_{70} , $Si_2H_6H_{16}$, $(SiH_4)_2H_{16}$, $SiH_4(H_{16})_3$, CH_{70} , NH_{69} , NH_{70} , NHH_{70} , OH_{70} , H_2OH_{70} , FH_{70} , H_3OH_{70} , SiH_2H_{60} , $Si(H_{16})_3H_{15}$, $Si(H_{16})_4$, $Si_2H_6(H_{16})_2$, $Si_2H_7(H_{16})_2$, $SiH_3(H_{16})_4$, $(SiH_4)_2(H_{16})_2$, $O_2(H_{16})_4$, $SiH_4(H_{16})_4$, NOH_{70} , O_2H_{69} , $HONH_{70}$, O_2H_{70} , H_2ONH_{70} , $H_3O_2H_{70}$, $Si_2H_6(H_{24})_2$, $Si_2H_6(H_{16})_3$, $(SiH_4)_3H_{16}$, $(SiH_4)_2(H_{16})_3$, $(OH_{23})H_{16}H_{70}$, $(OH_{24})H_{16}H_{70}$, $Si_3H_{10}(H_{16})_2$, Si_2H_{70} , $Si_3H_{11}(H_{16})_2$, $Si_2H_7(H_{16})_4$, $(SiH_4)_3(H_{16})_2$, $(SiH_4)_2(H_{16})_4$, $NaOSiH_2(H_{16})_4$, $NaKH_7H_{70}$, $Si_2H_7(H_{70})$, $Si_3H_9(H_{16})_3$, $Si_3H_{10}(H_{16})_3$, $Si_2H_6(H_{16})_5$, $(SiH_4)_4H_{16}$, $(SiH_4)_3(H_{16})_3$, $Na_2OSiH_2(H_{16})_4$, $Si_3H_8(H_{16})_4$, $Na_2KH_7H_{70}$, $Si_3H_9(H_{16})_4$, $Na_2HKH_7H_{70}$, $SO(H_{16})_6(H_{15})$, $SH_2(OH_{23})H_{16}H_{70}$, $SO(H_{16})_7$, $Mg_2H_2H_{23}H_{16}H_{70}$, $(SiH_4)_4(H_{16})_2$, $(SiH_4)_3(H_{16})_4$, $KH_3O(H_{16})_2H_{70}$, $KH_5O(H_{16})_2H_{70}$, $K(OH_{23})H_{16}H_{70}$, $K_2OH_7H_{70}$, $NaKHO_2H_{70}$, $NaOHNaO_2H_{70}$, $HNO_3O_2H_{70}$, $Rb(H_{16})_5$, $Si_3H_{11}H_{70}$, $KNO_2(H_{16})_3$, $(SiH_4)_4(H_{16})_3$, $KKH(H_{16})_7$, $(SiH_4)_4(H_{16})_4$, $(KH_2)_2(H_{16})_3H_{70}$, $(NiH_2)_2HCl(H_{16})_2H_{70}$, Si_3OH_{102} , $(SiH_3)_7(H_{16})_5$, $Na_3O_3(SiH_3)_{10}SiH(H_{16})_5$, X is other element, and the hydrogen content H of the compound comprises at least one increased binding energy hydrogen.

159. A method of claim 121, having a formula MX wherein M is positive, neutral, or

negative and is selected from the list of H_{16} , $H_{16}H$, $H_{16}H_2$, $H_{24}H_{23}$, OH_{22} , OH_{23} , OH_{24} , MgH_2H_{16} , NaH_3H_{16} , $H_{24}H_2O$, CNH_{16} , CH_{30} , SiH_4H_{16} , $(H_{16})_3H_{15}$, $SiH_4(H_{16})_2$, $(H_{16})_4$, H_{70} , $Si_2H_6H_{16}$, $(SiH_4)_2H_{16}$, $SiH_4(H_{16})_3$, CH_{70} , NH_{69} , NH_{70} , NHH_{70} , OH_{70} , H_2OH_{70} , FH_{70} , H_3OH_{70} , SiH_2H_{60} , $Si(H_{16})_3H_{15}$, $Si(H_{16})_4$, $Si_2H_6(H_{16})_2$, $Si_2H_7(H_{16})_2$, $SiH_3(H_{16})_4$, $(SiH_4)_2(H_{16})_2$, $O_2(H_{16})_4$, $SiH_4(H_{16})_4$, NOH_{70} , O_2H_{69} , $HONH_{70}$, O_2H_{70} , H_2ONH_{70} , $H_3O_2H_{70}$,

$Si_2H_6(H_{24})_2$, $Si_2H_6(H_{16})_3$, $(SiH_4)_3H_{16}$, $(SiH_4)_2(H_{16})_3$, $(OH_{23})H_{16}H_{70}$, $(OH_{24})H_{16}H_{70}$,
 $Si_3H_{10}(H_{16})_2$, Si_2H_{70} , $Si_3H_{11}(H_{16})_2$, $Si_2H_7(H_{16})_4$, $(SiH_4)_3(H_{16})_2$, $(SiH_4)_2(H_{16})_4$,
 $NaOSiH_2(H_{16})_4$, $NaKH H_{70}$, $Si_2H_7(H_{70})$, $Si_3H_9(H_{16})_3$, $Si_3H_{10}(H_{16})_3$,
 $Si_2H_6(H_{16})_5$, $(SiH_4)_4H_{16}$, $(SiH_4)_3(H_{16})_3$, $Na_2OSiH_2(H_{16})_4$, $Si_3H_8(H_{16})_4$,
 $Na_2KH H_{70}$, $Si_3H_9(H_{16})_4$, $Na_2HKH H_{70}$, $SO(H_{16})_6(H_{15})$,
 $SH_2(OH_{23})H_{16}H_{70}$, $SO(H_{16})_7$, $Mg_2H_2H_{23}H_{16}H_{70}$, $(SiH_4)_4(H_{16})_2$,
 $(SiH_4)_3(H_{16})_4$, $KH_3O(H_{16})_2H_{70}$, $KH_5O(H_{16})_2H_{70}$, $K(OH_{23})H_{16}H_{70}$,
 $K_2OH H_{70}$, $NaKHO_2H_{70}$, $NaOHNaO_2 H_{70}$, $HNO_3 O_2 H_{70}$, $Rb(H_{16})_5$,
 $Si_3H_{11}H_{70}$, $KNO_2(H_{16})_5$, $(SiH_4)_4(H_{16})_3$, $KKH(H_{16})_7$, $(SiH_4)_4(H_{16})_4$,
 $(KH_2)_2(H_{16})_3H_{70}$, $(NiH_2)_2HCl(H_{16})_2H_{70}$, Si_5OH_{102} , $(SiH_3)_7(H_{16})_5$,
 $Na_3O_3(SiH_3)_{10}SiH(H_{16})_5$, X is an increased binding energy hydrogen compound,
 and the hydrogen content H of the compound comprises at least one increased
 binding energy hydrogen.

160. A method of claim 121, having a formula $M(H_x)_n$ wherein n is an integer, x is
 an integer from 8 to 12, M is other element such as any atom, molecule, or compound,
 and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased
 binding energy hydrogen species.

161. A method of claim 121, having a formula $M(H_x)_n$ wherein n is an integer, x is
 an integer from 8 to 12, M is an increased binding energy hydrogen compound, and
 the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding
 energy hydrogen species.

162. A method of claim 121, having a formula $M^+(H_x)_n^+$ wherein n is an integer, x is
 an integer from 14 to 18, M is other element such as an alkali, organic, organometallic,
 inorganic, or ammonium cation, and the hydrogen content $(H_x)_n^+$ of the compound
 comprises at least one increased binding energy hydrogen species.

163. A method of claim 121, having a formula $M^+(H_x)_n^+$ wherein n is an integer, x is
 an integer from 14 to 18, M is an increased binding energy hydrogen compound, and

the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.

164. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 14 to 18, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.
165. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 14 to 18, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.
166. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 22 to 26, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.
167. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 22 to 26, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.
168. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 58 to 62, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.
169. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 58 to 62, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.

170. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 68 to 72, M is an atom, molecule, or compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species

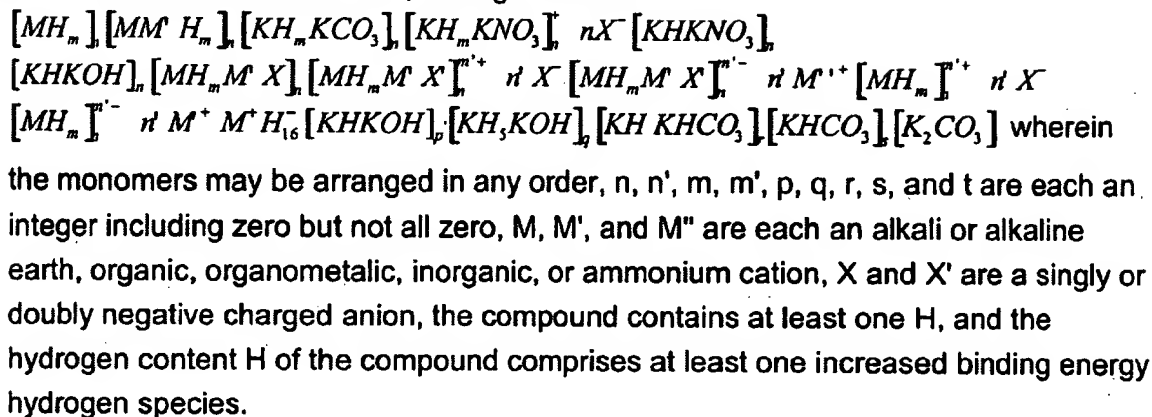
171. A method of claim 121, having a formula $M(H_x)_n$, wherein n is an integer, x is an integer from 68 to 72, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_x)_n$ of the compound comprises at least one increased binding energy hydrogen species.

172. A method of claim 121, having a formula $M(H_x)_q(H_x)_r(H_y)_s(H_y)_t(H_z)_u$, wherein the monomers may be arranged in any order, q, r, s, t, and u are each an integer including zero but not all zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M is other element such as any atom, molecule, or compound, and the hydrogen content $(H_x)_q(H_x)_r(H_y)_s(H_y)_t(H_z)_u$ of the compound comprises at least one increased binding energy hydrogen species.

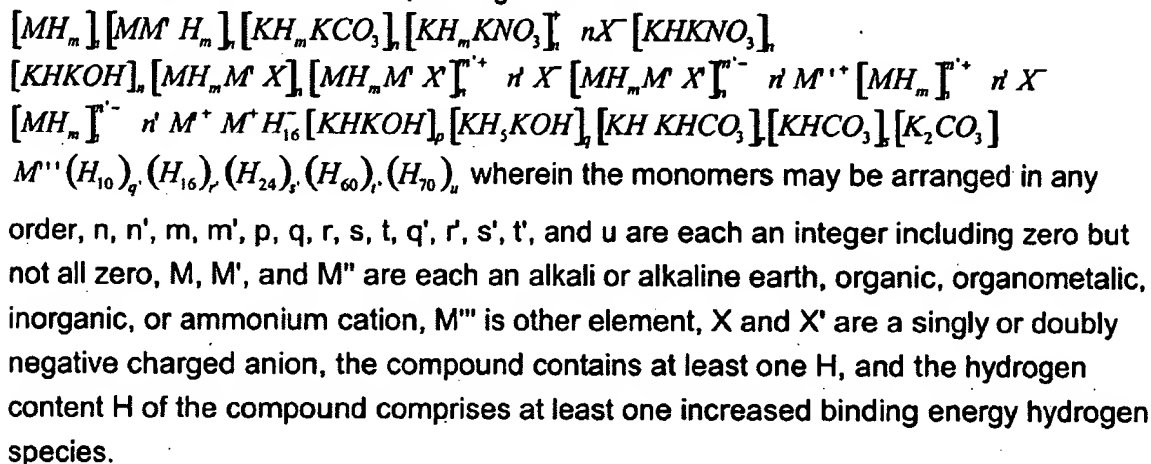
173. A method of claim 121, having a formula $M(H_x)_q(H_x)_r(H_y)_s(H_y)_t(H_z)_u$, wherein the monomers may be arranged in any order, q, r, s, t, and u are each an integer including zero but not all zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M is an increased binding energy hydrogen compound, and the hydrogen content $(H_x)_q(H_x)_r(H_y)_s(H_y)_t(H_z)_u$ of the compound comprises at least one increased binding energy hydrogen species.

174. A method of claim 121, having a formula $[KHKOH]_p[KH_3KOH]_q[KH KHCO_3]_r[KHCO_3]_s[K_2CO_3]_t$ wherein the monomers may be arranged in any order, p, q, r, s, and t are each an integer including zero but not all zero, the compound contains at least one H, and the hydrogen content H of the compound comprises at least one increased binding energy hydrogen.

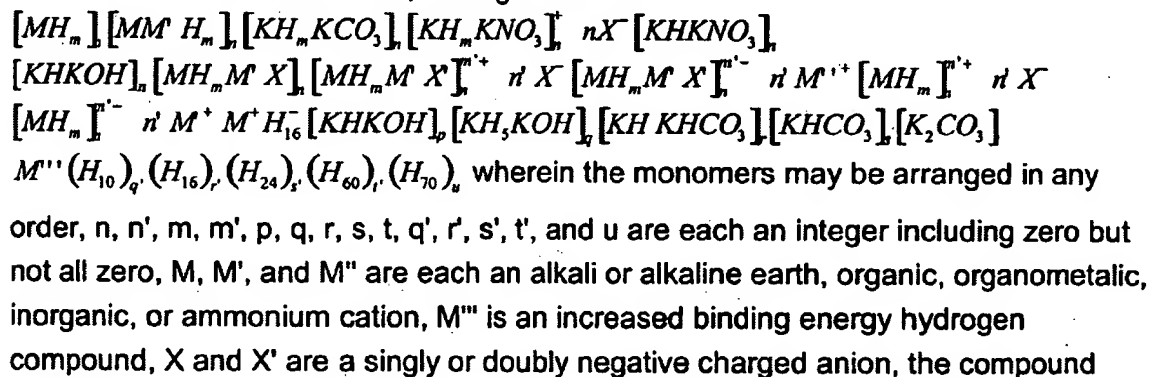
175. A method of claim 121, having a formula



176. A method of claim 121, having a formula



177. A method of claim 121, having a formula



contains at least one H, and the hydrogen content H of the compound comprises at least one increased binding energy hydrogen species.

178. A method of claim 121, having a formula

$[MH_m] [MM' H_m] [KH_m KCO_3] [KH_m KNO_3] nX [KHKNO_3]$
 $[KHKOH]_n [MH_m M' X] [MH_m M' X]^{n+} n' X [MH_m M' X]^{n-} n' M'' [MH_m]^{n+} n' X$
 $[MH_m]^{n-} n' M'' M' H_{16} [KHKOH]_p [KH_3 KOH]_q [KH KHCO_3] [KHCO_3] [K_2 CO_3]$
 $M''' (H_x)_q (H_x)_r (H_y)_s (H_y)_t (H_z)_u$ wherein the monomers may be arranged in any order,
 n, n', m, m', p, q, r, s, t, q', r', s', t', and u are each an integer including zero but not all
 zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22
 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M, M', and M'' are
 each an alkali or alkaline earth, organic, organometallic, inorganic, or ammonium
 cation, M''' is other element, X and X' are a singly or doubly negative charged anion,
 the compound contains at least one H, and the hydrogen content H of the compound
 comprises at least one increased binding energy hydrogen species.

179. A method of claim 121, having a formula

$[MH_m] [MM' H_m] [KH_m KCO_3] [KH_m KNO_3] nX [KHKNO_3]$
 $[KHKOH]_n [MH_m M' X] [MH_m M' X]^{n+} n' X [MH_m M' X]^{n-} n' M'' [MH_m]^{n+} n' X$
 $[MH_m]^{n-} n' M'' M' H_{16} [KHKOH]_p [KH_3 KOH]_q [KH KHCO_3] [KHCO_3] [K_2 CO_3]$
 $M''' (H_x)_q (H_x)_r (H_y)_s (H_y)_t (H_z)_u$ wherein the monomers may be arranged in any order,
 n, n', m, m', p, q, r, s, t, q', r', s', t', and u are each an integer including zero but not all
 zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22
 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M, M', and M'' are
 each an alkali or alkaline earth, organic, organometallic, inorganic, or ammonium
 cation, M''' is an increased binding energy hydrogen compound, X and X' are a singly
 or doubly negative charged anion, the compound contains at least one H, and the
 hydrogen content H of the compound comprises at least one increased binding energy
 hydrogen species.

180. A method of claim 121, having a formula


$[MH_m] [MM' H_m] [KH_m KCO_3] [KH_m KNO_3] nX [KHKNO_3]$

$[KHKOH]_n [MH_m M' X]_p [MH_m M' X]_q^{n+} n X^- [MH_m M' X]_r^{n-} n M'^{n+} [MH_m]_s^{n+} n X^-$
 $[MH_m]_t^{n-} n M'^{n+} M'^{n-} H_{16} [KHKOH]_p [KH_3 KOH]_q [KH KHCO_3]_r [KHCO_3]_s [K_2 CO_3]_t$
 $M''' (H_x)_q (H_x)_r (H_y)_s (H_y)_t (H_z)_u$ wherein the monomers may be arranged in any order,
 n, n', m, m', p, q, r, s, t, q', r', s', t', and u are each an integer including zero but not all
 zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22
 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M, M' and M'' are
 each a metal such as silicon, aluminum, Group III A elements, Group IVA elements, a
 transition metal, inner transition metal, tin, boron, or a rare earth, lanthanide, an alkali
 or alkaline earth, organic, organometallic, inorganic, or ammonium cation, M''' is other
 element, X and X' are a singly or doubly negative charged anion, the compound
 contains at least one H, and the hydrogen content H of the compound comprises at
 least one increased binding energy hydrogen species.

181. A method of claim 121, having a formula
 $[MH_m]_n [MM' H_m]_p [KH_m KCO_3]_q [KH_m KNO_3]_r n X^- [KHKNO_3]_s$
 $[KHKOH]_n [MH_m M' X]_p [MH_m M' X]_q^{n+} n X^- [MH_m M' X]_r^{n-} n M'^{n+} [MH_m]_s^{n+} n X^-$
 $[MH_m]_t^{n-} n M'^{n+} M'^{n-} H_{16} [KHKOH]_p [KH_3 KOH]_q [KH KHCO_3]_r [KHCO_3]_s [K_2 CO_3]_t$
 $M''' (H_x)_q (H_x)_r (H_y)_s (H_y)_t (H_z)_u$ wherein the monomers may be arranged in any order,
 n, n', m, m', p, q, r, s, t, q', r', s', t', and u are each an integer including zero but not all
 zero, x is an integer from 8 to 12, x' is an integer from 14 to 18, y is an integer from 22
 to 26, y' is an integer from 58 to 62, z is an integer from 68 to 72, M, M' and M'' are
 each a metal such as silicon, aluminum, Group III A elements, Group IVA elements, a
 transition metal, inner transition metal, tin, boron, or a rare earth, lanthanide, an alkali
 or alkaline earth, organic, organometallic, inorganic, or ammonium cation, M''' is an
 increased binding energy hydrogen compound, X and X' are a singly or doubly
 negative charged anion, the compound contains at least one H, and the hydrogen
 content H of the compound comprises at least one increased binding energy hydrogen
 species.

182. A method of claim 121, having a formula $Si_x H_y (H_{16})_z$ wherein x is an
 integer, y is an integer from $2x+2$ to $4x$, z is an integer, and the hydrogen content H of
 the compound comprises at least one increased binding energy hydrogen species.

183. A method of claim 136, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
184. A method of claim 139, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
185. A method of claim 140, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
186. A method of claim 141, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
187. A method of claim 142, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
188. A method of claim 175, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
189. A method of claim 176, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
190. A method of claim 177, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.

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191. A method of claim 178, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
192. A method of claim 179, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
193. A method of claim 180, wherein said singly negative charged anion is selected from the group consisting of halogen ions, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
194. A method of claim 181, wherein said singly negative charged anion is selected from the group consisting of halogen ion, hydroxide ion, hydrogen carbonate ion, dihydrogen phosphate, and nitrate ion.
195. A method of claim 139, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.
196. A method of claim 140, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.
197. A method of claim 142, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.
198. A method of claim 175, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

199. A method of claim 176, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

200. A method of claim 177, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

201. A method of claim 178, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

202. A method of claim 179, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

203. A method of claim 180, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.

204. A method of claim 181, wherein said doubly negative charged anion is selected from the group consisting of carbonate ion, oxides, phosphates, hydrogen phosphates, and sulfate ion.
